

NEW UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. 1.53(b))

Docket No.
P7240.0001/P076

Total pages in this
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TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

PALM AND TURN CHILD RESISTANT CLOSURE

and invented by:

John Tauber

IF A CONTINUATION APPLICATION, check appropriate box and supply requisite information:

☐ Continuation ☐ Divisional

☐ Continuation-in-part (CIP) of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 18 page(s) and including the following:
 - a. ☒ Descriptive title of the invention
 - b. ☐ Cross references to related applications (*if applicable*)
 - c. ☐ Statement regarding Federally-sponsored research/development (*if applicable*)
 - d. ☐ Reference to microfiche appendix (*if applicable*)
 - e. ☒ Background of the invention
 - f. ☒ Brief summary of the invention
 - g. ☒ Brief description of the drawings (*if drawings filed*)
 - h. ☒ Detailed description
 - i. ☒ Claims as classified below
 - j. ☒ Abstract of the disclosure

jc803 U.S. PTO

07/27/00

jc759 U.S. PTO

09/627155

07/27/00

Application Elements (continued)

3. ☒ Drawing(s) (when necessary as prescribed by 35 U.S.C. 113)
☐ Formal ☒ Informal Number of sheets: 4
4. ☒ Oath or Declaration
a. ☒ Newly executed (original or copy) ☐ Unexecuted
b. ☐ Copy from a prior application (37 C.F.R. 1.63(d) (for continuation/divisional applications only)
c. ☒ With Power of Attorney ☐ Without Power of Attorney
5. ☐ Incorporation by reference (usable if Box 4b is checked)
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Computer program in microfiche
7. ☐ Genetic sequence submission (if applicable, all must be included)
a. ☐ Paper copy
b. ☐ Computer readable copy
c. ☐ Statement verifying identical paper and computer readable copies

Accompanying Application

8. ☒ Assignment papers (cover sheet & document(s))
9. ☐ 37 C.F.R. 3.73(b) statement (when there is an assignee)
10. ☐ English translation document (if applicable)
11. ☒ Information Disclosure Statement/PTO-1449 ☒ Copies of IDS citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☐ Certified copy of priority document(s) (if foreign priority is claimed)
15. ☐ Certificate of Mailing
☐ First Class ☐ Express Mail (Label No.: _____)
16. ☐ Small Entity statement(s) -- # submitted _____ (if Small Entity status claimed)

Accompanying Application (continued)

- 17.
- ☐
- Additional enclosures (please identify below):

Fee Calculation and Transmittal

The filing fee for this utility patent application is calculated and transmitted as follows:

☒ Large Entity☐ Small Entity

<u>CLAIMS AS FILED</u>					
For	# Filed	# Allowed	# Extra	Rate	Fee
Total Claims	20	- 20 =		x \$18.00	
Independent Claims	3	- 3 =		x \$78.00	
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					
Other Fees (specify purpose): Recordation Form Cover Sheet					\$40.00
BASIC FEE					\$690.00
TOTAL FILING FEE					\$730.00

☒ A check in the amount of \$730.00 to cover the total filing fee is enclosed.☒ The Commissioner is hereby authorized to charge and Deposit Account No. 4 - 1073 as described below. A duplicate copy of this sheet is enclosed.☐ Charge the amount of _____ as filing fee.☒ Credit any overpayment.☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.31(b).

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Dated: July 26, 2000

PALM AND TURN CHILD RESISTANT CLOSURE

BACKGROUND

This invention relates to a closure for containers and, in particular, to a palm and turn child resistant safety closure for containers.

5 The hazards associated with medicine, pharmaceuticals, or other toxic materials are widely known. These materials are typically distributed in containers and can be found, in one form or another, in almost every household across America. When it comes to the containers housing these materials, safety closures have been utilized to prevent a child from opening the container and accessing its harmful contents.

10 Many of today's safety closures include a number of cooperating parts. These closures typically include at least two cap portions and a safety mechanism. The first cap portion engages a container while the second cap portion is used to rotate the first cap portion only after the safety mechanism has been engaged or disengaged (depending upon the type of safety mechanism employed). Typically, the elements of
15 the safety mechanism are placed on both the first and second cap portions, requiring the user to operate the closure in a specific manner to remove the closure from the container.

Certain objectives underlie the design of a successful safety closure. They should be capable of being placed on conventional container necks using conventional
20 capping machines. The closures should comprises as few parts as possible and the parts should be readily assembled with a minimum number of mechanical or manual

operations. The parts should be shaped and structured such that they can be fabricated at high speed in modern plastic injection molding machinery.

From a safety standpoint, a closure should require movement that is simple for an adult to open the container, but which requires simultaneous manipulations of at least two different mechanisms that are beyond the comprehension and manual manipulation of a small child.

Thus, there is a desire and need for a safety closure that is easy to manufacture and easily manipulated by an adult, yet child resistant.

SUMMARY

10 The present invention provides a safety closure for a container. The closure includes an outer cap and an inner cap being rotatably received within the outer cap. The outer cap comprises a first top wall and a first cylindrical skirt depending from said first top wall, an inner surface of said first top wall having a plurality of lugs radially disposed thereon. The inner cap comprises a second top wall and a second cylindrical skirt depending from said second top wall, a plurality of recesses are radially disposed and formed at an intersection of said second top wall and second cylindrical skirt. The recesses are configured such that said lugs are received by at least some of said recesses when said outer cap is turned in a closure application direction causing said closure to be applied to a container. The recesses are further configured such that said lugs are not received by said recesses when said outer cap is turned in a closure opening

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direction unless a downward force is applied to said outer cap. When the downward force is applied to said outer cap and said outer cap is simultaneously turned in the closure opening direction said lugs are received by said recesses allowing said inner cap to be rotated and removed from the container.

5 In another aspect of the invention, a child resistant safety closure is provided.

The closure contains an outer cap and an inner cap being rotatably received within the outer cap. The outer cap comprises a first top wall and a first cylindrical skirt depending from said first top wall, a plurality of lugs are radially disposed and formed at an intersection of said first top wall and said first cylindrical skirt. The inner cap

10 comprising a second top wall and a second cylindrical skirt depending from said second top wall, a plurality of recesses are formed on an outer surface of said second top wall.

The recesses are configured such that said lugs are received by at least some of said recesses when said outer cap is turned in a closure application direction. The recesses are further configured such that said lugs are not received by said recesses when said

15 outer cap is turned in a closure opening direction unless a downward force is simultaneously applied to said outer cap.

In another aspect, a safety closure for a container having an outer cap and an inner cap being rotatably received within the outer cap is provided. The outer cap comprises a first top wall and a first cylindrical skirt depending from said first top wall, a plurality of lugs are radially disposed and formed at an intersection of said first top wall and said first cylindrical skirt. The inner cap comprises a second top wall and a second

20

cylindrical skirt depending from said second top wall, a plurality of recesses are radially disposed and formed at an intersection of said second top wall and said second cylindrical skirt, each of said recesses comprise a vertical wall and an inclined wall. The lugs act on said vertical walls when said outer cap is turned in a closure application
5 direction and said lugs slide up said inclined walls when said outer cap is turned in a closure opening direction and a downward force is not being applied to the outer cap.

It is an object of the invention to provide a child resistant safety closure for a container.

It is a further object of the invention to provide a safety closure with at least
10 one lug on an outer cap being received by a respective at least one recess on an inner cap when the outer cap is rotated in a closure application direction to allow the closure to be applied to a container.

It is a further object of the invention to provide a safety closure with recesses on an inner cap that are configured to prevent lugs of an outer cap from being received
15 within the recesses when the outer cap is rotated in a closure opening direction unless a downward force is applied to the outer cap.

Other objects, features and advantages of the present invention will become apparent from the following detailed description and drawings of preferred embodiments of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective exploded view of a palm and turn child resistant safety closure constructed in accordance with a preferred embodiment of the present invention.

5 FIG. 2 is a top perspective view of an exemplary outer cap of the closure illustrated in FIG. 1.

FIG. 3 is a top perspective view of an exemplary inner cap of the closure illustrated in FIG. 1.

10 FIG. 4 is a top view of an exemplary inner cap of the closure illustrated in FIG. 1.

FIG. 5 is a cross-sectional view taken along line V-V of FIG. 4.

FIG. 6 is a magnified view of a portion of the cross-sectional illustrated in FIG. 5.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

15 With reference to FIGS. 1-6, a palm and turn child resistant safety closure 10 is shown according to a preferred embodiment of the present invention. The closure 10 includes an outer cap 20 and an inner cap 50. The inner cap 50 is sized to be rotatably received within the outer cap 20. It is desirable that the closure 10 be molded in a conventional molding tool and that the caps 20, 50 be formed of plastic.

The outer cap 20 includes a cylindrical top wall 22. A cylindrical skirt 30 depends from the top wall 22. An annular lip receptor 38 is formed at a lower portion 36 of the skirt 30. As will become apparent below, the receptor 36 will receive an annular lip 72 of the inner cap 50 to movably maintain the inner cap 50 within the
5 outer cap 20.

An inner surface 26 of the top wall 22 contains a number of lugs 40 radially disposed thereon. The lugs 40 will be received by lug receptor recesses 60 formed in the inner cap 50. In a preferred embodiment, the lugs 40 are formed adjacent the intersection of the top wall 22 and the skirt 30. When the outer cap 20 is turned in a
10 closure application direction, the lugs 40 will be received by some of the recesses 60, causing the lugs 40 to act on a vertical wall 62 of the recess 60 and causing the closure 10 to be applied to a container. In one exemplary embodiment, there are at least twelve lugs 40 and at least twelve recesses 60. In a preferred embodiment, there are at least twenty-four lugs 40 and twenty-four recesses 60. By using at least twelve lugs 40
15 and twenty-four recesses 60, the user, in a worst case scenario, merely has to turn the outer cap 20 approximately an eighth of an inch or 15 degrees before the lugs 40 are received in the recesses 60, which makes it relatively easy for the user to apply the closure 10 to the container. It should be noted that any number of lugs 40 and recesses 60 may be used to practice the invention and the invention should not be limited to a
20 particular number of lugs 40 and recesses 60.

When the outer cap 20 is turned in a closure opening direction, the lugs 40 will be slide up an inclined wall 64 of the recesses 60, preventing the lugs 40 from being received by any of the recesses 60. In order for the lugs 40 to be received by the recesses 60 when the outer cap 20 is rotated in the closure opening direction, a downward force must be simultaneously applied. The downward force causes the lugs 40 to engage the inclined walls 64 of the recesses, keeping the lugs 40 within the recesses 60 so that the lugs 40 can act on the inclined walls 64 and cause the closure 10 to be rotated off the container. Thus, the closure 10 requires simultaneous manipulations of at least two different mechanisms that are beyond the comprehension and manual manipulation of a small child.

In another exemplary embodiment of the closure 10, the top wall 22 of the outer cap 20 has a beveled edge 28 (FIG. 2) and the cylindrical skirt 30 depends from the beveled edge 28. In another exemplary embodiment, the skirt 30 contains a outer surface having a plurality of ridges 32 formed thereon. The ridges 32 help a user grip the outer cap 20 when applying or removing the closure 10. Moreover, it is also desirable for the outer surface 24 of the top wall 22 to contain indicia 42 instructing the user how to operate the closure. It should be noted that the beveled edge 28, ridges 32 and indicia 42 are not required to practice the invention.

Referring to FIGS. 1 and 3, the inner cap 50 includes a cylindrical top wall 52. A cylindrical skirt 70 depends from the inner cap 50 top wall 52. The annular lip 72 is formed at a lower portion of the skirt 70. When the outer cap 20 is snapped onto

the inner cap 50, the lip 72 is received by the lip receptor 38 so that the inner cap 50 is movably maintained within the outer cap 20. Thus engaged, there will be both vertical movement and horizontal rotational movement between the inner and outer caps 50, 20. It should be noted that in another embodiment the inner cap 50 may be

5 maintained within the outer cap 20 without the use of the lip 72.

An inner surface 76 of the skirt 70 is threaded 78 so that the inner cap 50 may be threadably engaged to a container having a threaded neck. A surface 54 of the inner cap 50 top wall 52 contains the plurality of recesses 60 formed therein. In one preferred embodiment, the recesses 60 are formed at the intersection of the inner cap

10 50 top wall 52 and skirt 70. As noted above, the recesses comprises the vertical wall 62 and inclined wall 64. The recesses 60 also include a bottom wall 66 and a rear wall 68.

The recesses 60 are configured to receive the lugs 40 of the outer cap 20 when the outer cap 20 is rotated in the closure application direction. That is, when the outer cap 20 is rotated in the closure application direction, the lugs 40 lie within the

15 walls 62, 64, 66, 68 of the recess 60. The lugs 40 also act on the vertical wall 62 to cause the inner cap 50 to rotate. The rotation of the inner cap 50 will be in the closure application direction, meaning that the threaded portion 78 of the inner cap 50 will engage the threaded portion of the container. By continuing to turn the outer cap 20 in the closure application direction, the inner cap 50, and thus the closure 10, will be

20 properly applied to the container. An inner surface 56 of the top wall 52 seals off any contents of the container when the closure 10 is applied to it.

The recesses 60 are further configured to prevent the lugs 40 of the outer cap 20 from being received when the outer cap 20 is rotated in the closure opening direction unless a downward force is simultaneously applied to the outer cap 20 during the rotation. That is, when the outer cap 20 is rotated in the closure opening direction, without a downward force, the lugs 40 will slide up the inclined walls 64 of the recesses 60. Thus, when the outer cap 20 is rotated in the closure opening direction, the lugs 40 do not act on the inclined wall 64 in a manner that will cause the inner cap 50 to rotate. Since the inner cap 50 does not rotate, the threaded portion 78 of the inner cap 50 will not be disengaged from the threaded portion of the container and the closure 10 will not be removed from the container. Thus, as part of the child resistant mechanism of the present invention, an additional manipulation of the closure 10 is required to remove it from a container.

As noted above, the additional manipulation is the downward force that is simultaneously applied during the rotation of the outer cap 20 in the closure opening direction. When the outer cap 20 is rotated in the closure opening direction and the downward force is applied, the lugs 40 engage the inclined walls 64 of the recesses 60, which keeps the lugs 40 within the recesses 60. While the lugs 40 are within the recesses 60 and the closure is being rotated in the opening direction, the lugs 40 act on the inclined walls 64 causing the inner cap 50 to rotate. The rotation of the inner cap 50 will be in the closure opening direction, meaning that the threaded portion 78 of the inner cap 50 will disengage the threaded portion of the container. By continuing to

turn the outer cap 20 in the closure opening direction while simultaneously applying the downward force, the inner cap 50, and thus the closure 10, will be properly removed from the container.

Prior art closures have utilized domes and other mechanisms to separate their inner and outer caps. Often times these closure use flexible separators that slide down the dome when a force is applied to the outer cap. However, due to their shape, these domes have a high profile, leaving a larger gap between the inner and outer caps. The larger dome means that long separators are required to co-act with the domes, causing the prior art closures to utilize extra material, adding unnecessary expense to the final cost of the closure. By using recesses 60, the present invention has a low profile. Thus, the gap is reduced and less material is used to manufacture the closure 10 of the present invention.

In addition, by using recesses 60, the present invention can withstand long term top loading, which sometimes permanently deforms the flexible separators of the prior art closures. When the prior art closures are applied to containers and then subject to long term top loading, typically during shipping and vertical stacking, the flexible members can deform and lose their resiliency. Once the separators are deformed, the closure is no longer child resistant. Thus, the prior art closures may be ineffective even before getting into the hands of the consumer. As noted above, the closure 10 of the present invention uses recesses 60 and lugs 40, which are much

stronger than flexible members and will not deform when subject to long term top loading.

Moreover, the closure 10 of the present invention is substantially more durable than the prior art closures. The prior art closures typically rely on flexible
5 separators for its child resilient feature. The flexible separators may become ineffective over time. When prior art closures age, the separators begin to lose their resiliency, which reduces the downward force required to open the closure and thus, reduces the overall effectiveness of the child safety feature of the prior art closure. As noted above, the closure 10 of the present invention uses recesses 60 and lugs 40, which are much
10 stronger than flexible members. Moreover, the present invention does not rely on elements that must remain flexible or resilient over time, and thus, the closure 10 of the present invention is less likely to become ineffective as the closure 10 ages.

It should also be noted that the closure 10 is easy to manufacture. Referring to FIGS. 4 to 6, and in particular, the region denoted by reference numeral 82, it can
15 be seen from the cross-section that the inner cap top wall 52 and skirt 70 have a substantially uniform thickness t in the regions adjacent to the recesses 60. This means that the inner cap 50 can be molded by a simple process without numerous molding steps. Region 82 denotes a portion of the inner cap 52 that would have been present if recesses 60 were not used by the present invention. The formation of the recesses 60 in
20 this manner also improves the strength and durability of the inner cap 50, its child resistant mechanism and the closure 10. In addition, the design of the closure 10

provides for a straight pull out from the cavity of the tool used to mold the closure 10, which also makes the closure 10 easy to mold.

While the invention has been described in detail in connection with preferred embodiments known at the time, it should be readily understood that the invention is not limited to such disclosed embodiments. Rather, the invention can be modified to incorporate any number of variations, alterations, substitutions or equivalent arrangements not heretofore described, but which are commensurate with the spirit and scope of the invention. Accordingly, the invention is not to be seen as limited by the foregoing description, but is only limited by the spirited scope of the appended claims.

10 What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A safety closure comprising:

an outer cap, comprising a first top wall and a first cylindrical skirt depending from said first top wall, an inner surface of said first top wall having a plurality of lugs radially disposed thereon; and

5 an inner cap being rotatably received by the outer cap, said inner cap comprising a second top wall and a second cylindrical skirt depending from said second top wall, a plurality of recesses are radially disposed and formed at an intersection of said second top wall and said second cylindrical skirt,

wherein said recesses are configured such that said lugs are received by at
10 least some of said recesses when said outer cap is turned in a closure application direction causing said closure to be applied to a container, said recesses are further configured such that said lugs are not received by said recesses when said outer cap is turned in a closure opening direction unless a downward force is applied to said outer cap, and when the downward force is applied to said outer cap and said outer cap is
15 simultaneously turned in the closure opening direction said lugs are received by said recesses allowing said inner cap to be rotated and removed from the container.

2. The closure of claim 1, wherein said recesses comprise a vertical wall and said lugs act on said vertical walls when said outer cap is turned in a closure application direction.

3. The closure of claim 1, wherein said recesses comprise an inclined wall and said lugs slide up said inclined walls when said outer cap is turned in the closure opening direction and the downward force is not being applied to the outer cap.

4. The closure of claim 1, wherein said inner surface of said first top wall
5 contains at least twelve lugs formed thereon and a number of recesses is at least twelve.

5. The closure of claim 1, wherein said inner surface of said first top wall contains twenty-four lugs formed thereon and a number of recesses is twenty-four.

6. The closure of claim 1, wherein said second top wall and said second cylindrical skirt have a substantially uniform thickness at locations of said recesses.

10 7. The closure of claim 1, wherein said first top cap contains a beveled edge and an outer surface of said first cylindrical skirt includes a plurality of ridges formed thereon.

8. A child resistant safety closure comprising:

an outer cap, comprising a first top wall and a first cylindrical skirt depending
15 from said first top wall, a plurality of lugs are radially disposed and formed at an intersection of said first top wall and said first cylindrical skirt; and

an inner cap being rotatably received by the outer cap, said inner cap comprising a second top wall and a second cylindrical skirt depending from said second top wall, a plurality of recesses are formed on an outer surface of said second top wall,

wherein said recesses are configured such that said lugs are received by at

- 5 least some of said recesses when said outer cap is turned in a closure application direction, said recesses are further configured such that said lugs are not received by said recesses when said outer cap is turned in a closure opening direction unless a downward force is simultaneously applied to said outer cap.

9. The closure of claim 8, wherein said recesses comprise a vertical wall and
10 said lugs act on said vertical walls when said outer cap is turned in a closure application direction.

10. The closure of claim 9, wherein said recesses comprise an inclined wall and said lugs slide up said inclined walls when said outer cap is turned in the closure opening direction and the downward force is not being applied to the outer cap.

- 15 11. The closure of claim 8, wherein said recesses comprise an inclined wall and said lugs slide up said inclined walls when the downward force is not being applied to the outer cap.

12. The closure of claim 8, wherein said plurality of recesses are radially disposed and formed at an intersection of said second top wall and said second cylindrical skirt.

13. The closure of claim 12, wherein said second top wall and said second
5 cylindrical skirt have a substantially uniform thickness at locations of said recesses.

14. The closure of claim 1, wherein said first top cap contains a beveled edge and an outer surface of said first cylindrical skirt includes a plurality of ridges formed thereon.

15. A safety closure comprising:

10 an outer cap, comprising a first top wall and a first cylindrical skirt depending from said first top wall, a plurality of lugs are radially disposed and formed at an intersection of said first top wall and said first cylindrical skirt; and

an inner cap being rotatably received by the outer cap, said inner cap comprising a second top wall and a second cylindrical skirt depending from said second
15 top wall, a plurality of recesses are radially disposed and formed at an intersection of said second top wall and said second cylindrical skirt, each of said recesses comprise a vertical wall and an inclined wall,

wherein said lugs act on said vertical walls when said outer cap is turned in a closure application direction and said lugs slide up said inclined walls when said outer

cap is turned in a closure opening direction and a downward force is not being applied to the outer cap.

16. The closure of claim 15, wherein said second top wall and said second cylindrical skirt have a substantially uniform thickness at locations of said recesses.

5 17. The closure of claim 15, wherein a number of lugs is at least twelve and a number of recesses is at least twelve.

18. The closure of claim 15, wherein a number of lugs is twenty-four and a number of recesses is twenty-four.

10 19. The closure of claim 15, wherein a number of lugs is at least twelve and a number of recesses is twenty-four.

20. The closure of claim 15, wherein an outer surface of said top wall comprises indicia for providing operating instructions to a user of said closure.

ABSTRACT

A safety closure having an outer cap and an inner cap being rotatably received by the outer cap is disclosed. The outer cap includes a top wall having a plurality of lugs formed thereon. The inner cap includes a top wall and a cylindrical skirt depending therefrom. The inner cap includes a plurality of lug receiving recesses formed at an intersection of the top wall and cylindrical skirt. The recesses have at least one vertical wall and at least one inclined wall. The lugs of the outer cap engage the vertical walls, and are received by the recesses, only when the outer cap is turned in a closure application direction, causing the closure to be applied to a container. The inclined walls of the recesses act on the lugs to prevent the lugs from being received in the recesses until a downward force is applied to the outer cap. When the downward force is applied to the outer cap and the outer cap is simultaneously turned in the closure opening direction, the lugs will engage the inclined walls and remain received by the recesses, allowing the inner cap to be rotated and removed from the container.

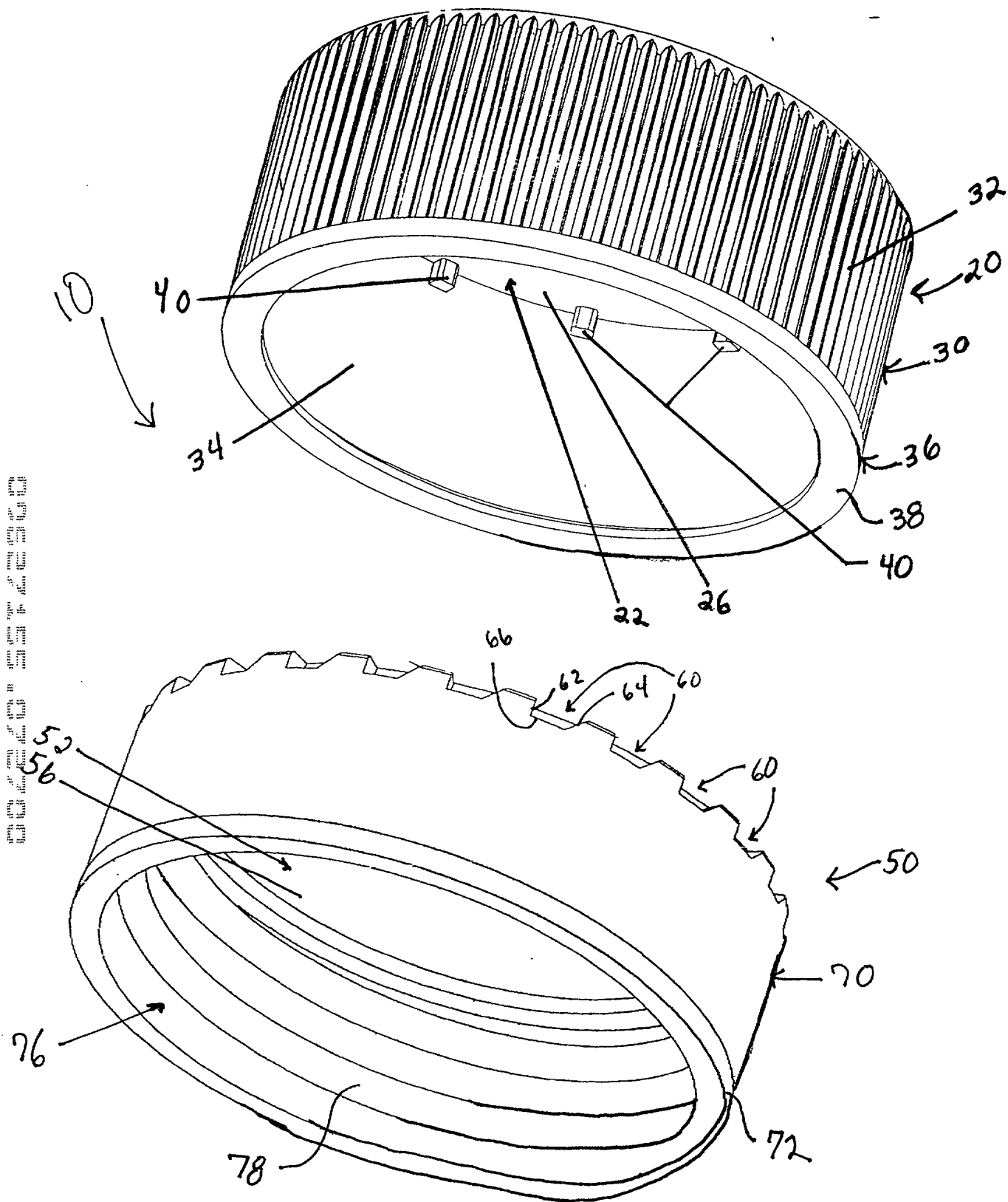


FIG. 1

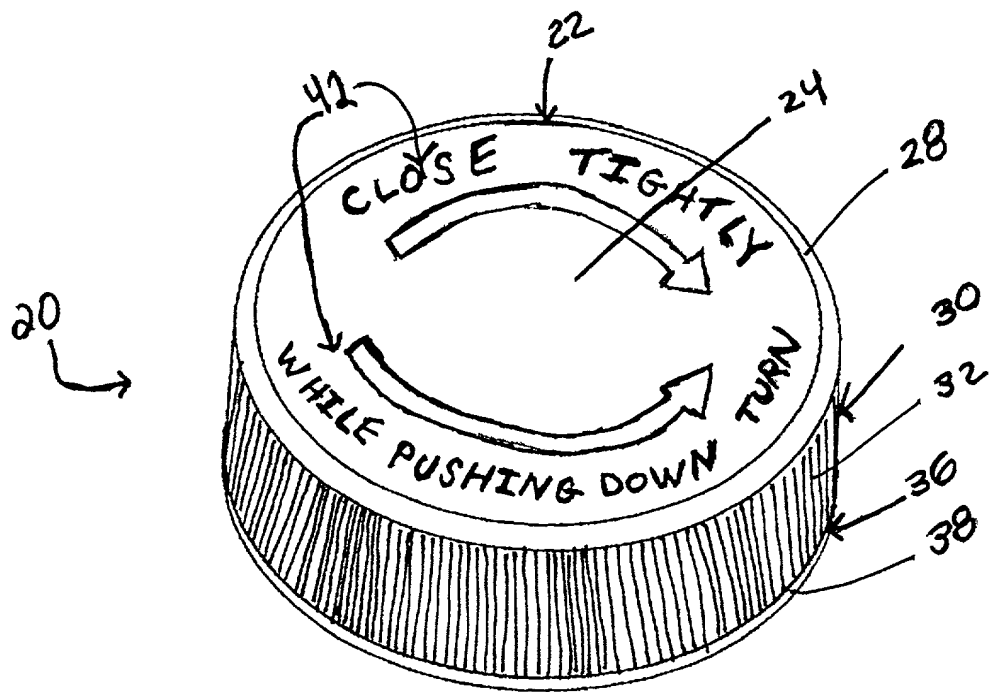


FIG. 2

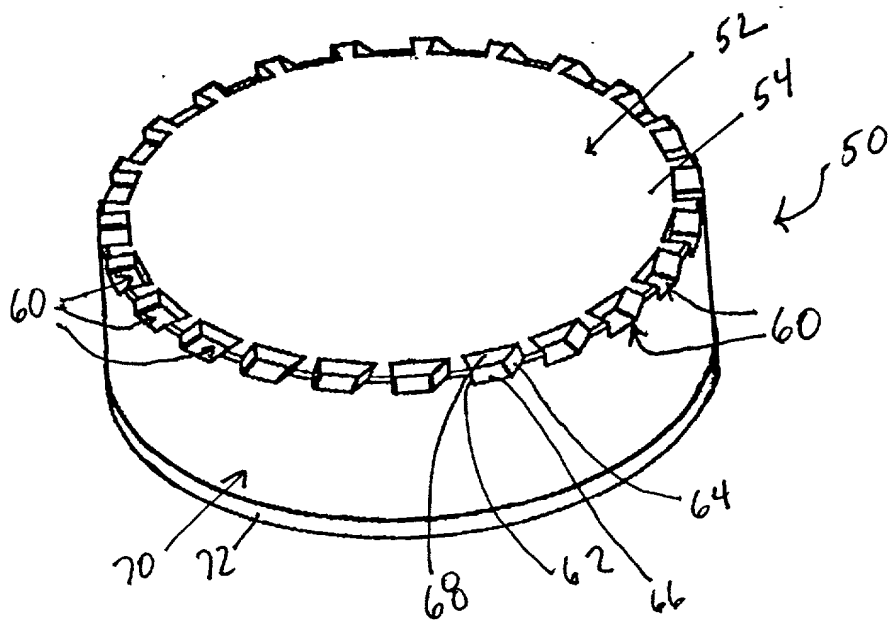


FIG. 3

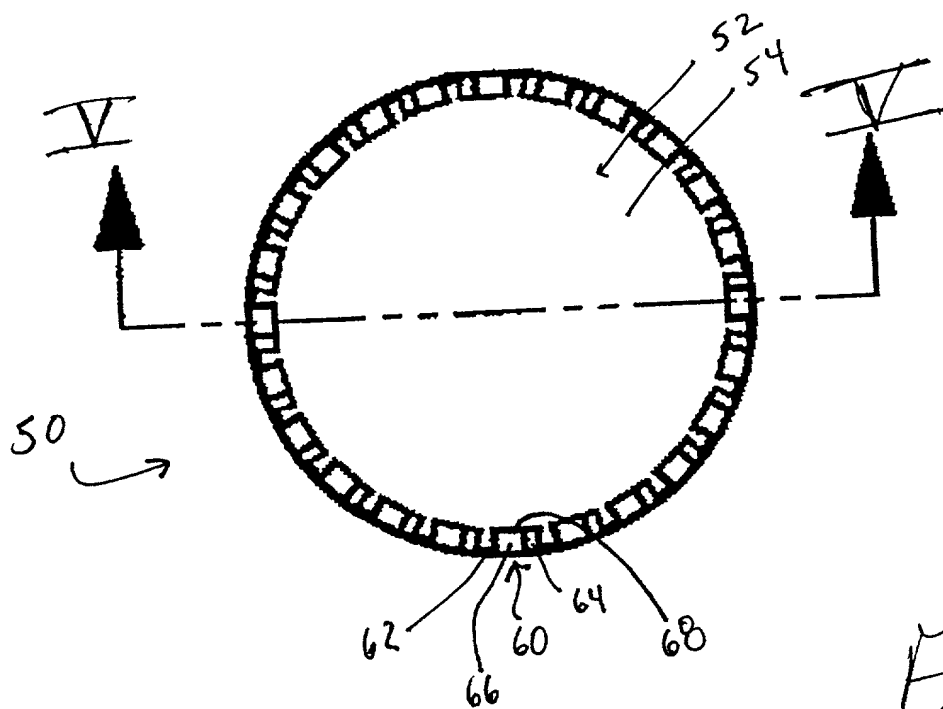


FIG. 4

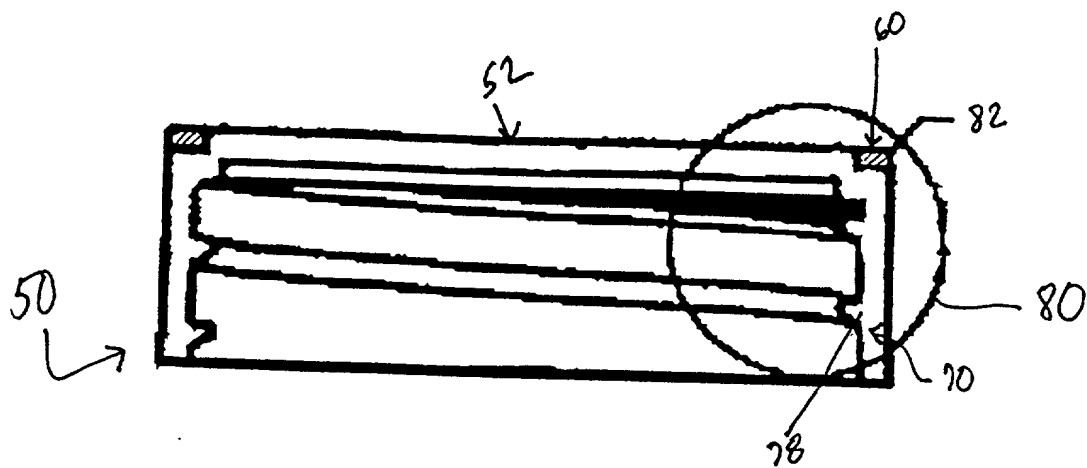


FIG. 5

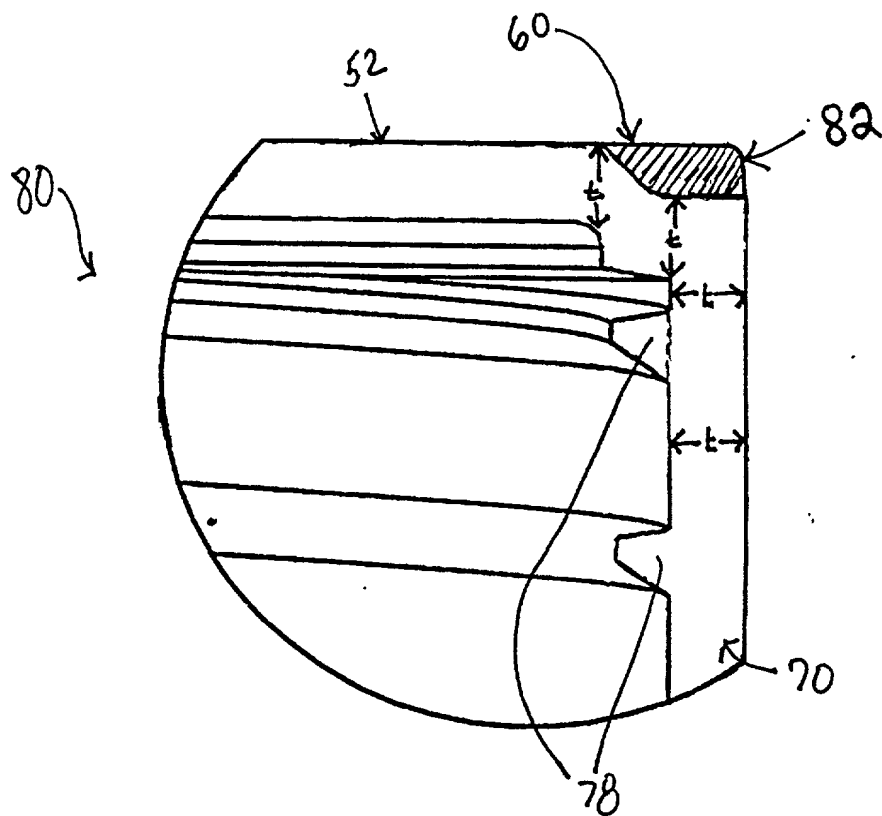


FIG. 6

Docket No.

P7240.0001/P076

Declaration and Power of Attorney for Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PALM AND TURN CHILD RESISTANT CLOSURE

the specification of which (check one)

☒ is attached hereto.

☐ was filed on _____
as United States Application No. or PCT International Application No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign applications(s) for patent or inventor's certificate, or Section 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not
Claimed

_____ (Number)	_____ (Country)	_____ (Filing Date)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Filing Date)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Filing Date)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.) (Filing Date)

(Application Serial No.) (Filing Date)

(Application Serial No.) (Filing Date)

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. Section 112. I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) (Filing Date) (Status)
(patented, pending, abandoned)

(Application Serial No.) (Filing Date) (Status)
(patented, pending, abandoned)

(Application Serial No.) (Filing Date) (Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

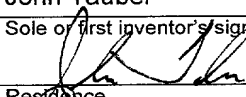
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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